AMENDMENTS TO THE CLAIMS

1. (Previously presented) A multi-junction solar cell assembly comprising:

a transparent substrate;

a transparent conductive coating formed on the transparent substrate, said transparent conductive coating comprising gallium nitride to provide a defect-free surface for growing an InGaN solar cell;

a solar cell including a plurality of gallium indium nitride junction layers grown successively on the transparent conductive coating;

an indium nitride junction layer formed on the plurality of gallium indium nitride junction layers; and

a metallization layer formed on the indium nitride junction layer;

wherein each successive gallium indium nitride junction laver has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer.

2. (Original) A multi junction solar cell assembly in accordance with claim 1 wherein the transparent substrate is selected from a group of transparent substrates consisting of sapphire, zinc oxide, and gallium nitride.

3. (Canceled).

4. (Previously presented) A multi junction solar cell assembly in accordance with claim 1 further comprising a gallium nitride junction layer between the transparent conductive coating and the plurality of gallium Indium nitride junction layers.

5. (Currently amended) The solar cell assembly of claim [[24]] 25, wherein the solar cell includes a plurality of gallium indium nitride junction layers having a thickness of between about 0.2 microns and about 1.0 microns.

6. (Canceled).

7. (Previously presented) The solar cell assembly of claim 5, wherein each layer of the plurality of gallium indium nitride junction layers has a gallium content of between about 90 wt % and about 10 wt % and an indium content of between about 90 wt % and about 10 wt %.

8. (Previously presented) The solar cell assembly of claim 5, wherein each successive layer of the plurality of gallium indium nitride junction layers has a gallium content less than the immediately preceding layer of the plurality of gallium indium nitride junction layers and an indium content greater than the immediately preceding layer of the plurality of gallium indium nitride junction layers.

9. (Previously presented) The solar cell assembly of claim 5, wherein each layer of the plurality of gallium indium nitride junction layers has a band gap of between about 0.7 eV and about 3.4 eV.

10. (Previously presented) The solar cell assembly of claim 5, wherein each successive layer of the plurality of gallium indium nitride junction layers has a band gap less than the band gap of the immediately preceding layer of the plurality of gallium indium nitride junction layers.

11. (Currently amended) The solar cell assembly of claim [[24]] 25, wherein the transparent conductive coating comprises:

a nucleation layer formed on the sapphire cover;

a lateral epitaxial overgrowth layer of gallium nitride formed on the nucleation layer; and

a defect-free gallium nitride layer formed on the lateral epitaxial overgrowth layer.

12. (Previously presented) The solar cell assembly of claim 11, wherein the nucleation layer comprises:

an aluminum nitride coating formed directly on the sapphire cover in intimate contact with the sapphire cover; and

a seed layer of gallium nitride formed on the aluminum nitride coating.

13. (Currently amended) The solar cell assembly of claim [[24]] 25, wherein the transparent conductive coating comprises:

a plurality of alternating layers of gallium nitride and aluminum gallium nitride; and

a plurality of quantum wells, each quantum well of the plurality of quantum wells formed at a corresponding interface between adjacent layers of gallium nitride and aluminum gallium nitride of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

14. (Previously presented) The solar cell assembly of claim 13 wherein a first gallium indium nitride junction layer of the plurality of gallium indium nitride junction layers is formed directly on a last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride in intimate contact with the last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

15. (Original) A multi junction solar cell assembly in accordance with claim 1 wherein the transparent conductive coating comprises a gallium nitride layer formed on the transparent substrate.

16. (Previously presented) The solar cell assembly of claim 5, further comprising a metal current collector bus for receiving electrical power collected from the plurality of gallium indium nitride junction layers by the transparent conductive coating.

17-19 (Cancelled)

20. (Previously presented) A method of forming a unitary multi junction solar cell assembly comprising:

forming a transparent conductive coating including gallium nitride on a sapphire cover; and

growing a solar cell including a plurality of gallium indium nitride junction layers on the transparent conductive coating without taking any measures to correct for lattice mismatch.

21. (Currently amended) A method in accordance with claim [[19]] 20 further comprising forming a metallization layer on the plurality of gallium indium nitride junction layers, wherein the metallization layer is selected from a group that includes a layer of aluminum, a layer of chromium, and a layer of titanium; and forming an Indium nitride junction layer on the plurality of gallium indium nitride junction layers between the metallization layer and the plurality of gallium indium nitride junction layers.

22. (Currently amended) A method in accordance with claim [[19]] 20 further comprising forming a gallium nitride junction layer on the transparent conductive coating between the transparent conductive coating and the plurality of gallium indium nitride junction layers.

23-24. (Cancelled)

25. (Previously presented) A solar cell assembly comprising:

a sapphire cover;

a GaN transparent conductive coating (TCC) as front collector, the GaN TCC formed on the sapphire cover; and

a multjunction InGaN solar cell grown on a GaN layer of the TCC;

wherein the GaN TCC provides a defect-free surface upon which the InGaN solar cell is grown.

26. (New) The solar cell assembly of claim 25, wherein the TCC is formed as a plurality of quantum wells; and wherein the InGaN solar cell is in intimate contact with the GaN layer.